Remarks

Reconsideration of this Application is respectfully requested.

Upon entry of the foregoing amendment, claims 1-20 are pending in the application, with 1, 6, 9, 14 and 20 being the independent claims. New claims 9-20 are sought to be added. These changes are believed to introduce no new matter, and their entry is respectfully requested.

Based on the above amendment and the following remarks, Applicants respectfully request that the Examiner reconsider all outstanding objections and rejections and that they be withdrawn.

Objection to the Specification

The specification has been amended to address a minor informality in response to the objection, as requested by the Examiner in the Office Action. Accordingly, reconsideration and withdrawal of the objection is respectfully requested.

Rejections under 35 U.S.C. § 102

Claim 1 stands rejected under 35 U.S.C. § 102(b) as being allegedly anticipated by Buzbee, U.S. Patent No. 5,815,720. Claim 1 has been amended to recite the step of "updating said feedback data during compile-time according to a predetermined propagation scheme." At least this aspect of the invention recited in claim 1 is not

disclosed in Buzbee. For example, Applicants respectfully direct the Examiner's attention to FIG. 5 of Buzbee, which was discussed in the Office Action, and which discloses a process of compiling object code, and then running it in a translator. Thus, there can be no updating of feedback data during the compilation process itself in Buzbee. In contrast, claim 1 (as amended) recites updating feedback data during compile-time.

Because not every element of claim 1 is taught by Buzbee, Applicants respectfully submit that Buzbee does not anticipate claim 1. Accordingly, Applicants respectfully request that the rejection of claim 1 under 35 U.S.C. § 102(b) be reconsidered and withdrawn.

Rejections under 35 U.S.C. § 103

Claims 2, 3, 4 and 5 stand rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Buzbee as applied to claim 1, in view of a number of references. Since claim 1 is allowable for the reasons discussed above, its dependent claims are allowable for at least the same reasons. Accordingly, Applicants respectfully request that the rejections under 35 U.S.C. § 103(a) of claims 2, 3, 4 and 5 be reconsidered and withdrawn.

Claim 6 stands rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Buzbee. Claim 6 has been amended to recite the aspect of updating "said feedback data during compile-time according a predefined propagation scheme." As discussed above with reference to claim 1, at least this aspect of the invention of claim 6 is not

taught or suggested by Buzbee. Accordingly, Applicants respectfully request that the rejection of claim 6 under 35 U.S.C. § 103(a) be reconsidered and withdrawn.

Claim 7 and 8, which depend from claim 6, are allowable at least for the reasons applicable to claim 6, as well as due to the features recited therein.

New Claims 9-20

New claims 9-20 have been added to provide additional coverage for the present invention.

Newly added independent claim 9 is directed to a combination of steps including the step of "annotating the first intermediate representation with previously gathered **global and local frequency data** from a plurality of sample executions of the computer program." (Emphasis added). At least this aspect of claim 9 is not taught or suggested in any of the cited references. Accordingly, claim 9 is allowable over any combination of the cited references at least due to the recitation of this aspect.

Newly added independent claim 14 is directed to a combination of steps including the step of "updating the feedback data according to a predefined propagation scheme **at multiple points during a compilation process**." (Emphasis added). At least this aspect of the invention of claim 14 is not taught or suggested in any of the cited references, singly or in combination. Accordingly, newly added claim 14 is allowable over any combination of the cited references at least due to the recitation of this aspect.

Newly added independent claim 20 is directed to a combination of steps including the step of "updating the **estimated** frequency data according to a predefined

propagation scheme." (Emphasis added). At least this aspect of the invention of claim 20 is not taught or suggested in any of the cited references. Accordingly, newly added claim 20 is allowable over any combination of the cited references at least due to the recitation of this aspect.

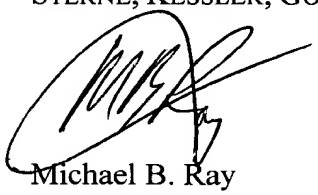
Conclusion

All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding objections and rejections and that they be withdrawn. Applicants believe that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment and Reply is respectfully requested.

Respectfully submitted,

STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.



Michael B. Ray
Attorney for Applicant
Registration No. 33,997

Date: 11/18/02

1100 New York Avenue, N.W.
Suite 600
Washington, D.C. 20005-3934
(202) 371-2600

Version with markings to show changes made

In the specification:

Please amend the specification, at the paragraph straddling pages 14 and 15, to read as follows:

EXACT values give a precise count of the number of times that a particular control flow graph edge was traveled during the program's instrumentated executions. GUESS values are educated estimates of the count, usually introduced by code cloning. Both EXACT and GUESS values are stored as [32-] 64-bit float values in order to permit scaling and counts that would overflow integer types. The examples presented herein use the symbols "!" and "?" to distinguish between EXACT and GUESS frequencies, respectively (see **FIG. 4**).

In the claims:

Please amend claims 1 and 6 as follows:

1. (Amended) A method for precise feedback data generation and updating during compile-time optimizations, within an optimizing compiler, comprising [the steps of]:

(1) accessing a first intermediate representation of [the] source code of a computer program, wherein said first intermediate representation includes instructions instrumented into the source code of said computer program;

(2) annotating said first intermediate representation with previously-gathered feedback data from a plurality of sample executions of said computer program;

(3) updating said feedback data during compile-time according to a pre-defined propagation scheme;

(4) performing an optimization of said first intermediate representation annotated with said feedback data updated in step (3), thereby producing a transformed intermediate representation; and

(5) repeating steps (3) and (4) at least once;

whereby the compiler produces more efficient executable program code from said first intermediate representation, thus speeding up [the] execution of said computer program.

6. (Amended) A computer program product comprising a computer usable medium having computer readable program code means embodied in said medium for causing an application program to execute on a computer that performs precise feedback data generation and updating during compile-time optimizations, within an optimizing compiler, said computer readable program code means comprising:

[a] first computer readable program code means for causing the computer to access a first intermediate representation of the source code of a computer program, wherein said first intermediate representation includes instructions instrumented into [the] source code of said computer program;

[a] second computer readable program code means for causing the computer to annotate said first intermediate representation with previously-gathered feedback data from a plurality of sample executions of said computer program;

[a] third computer readable program code means for causing the computer to update said feedback data during compile-time according to a pre-defined propagation scheme;

[a] fourth computer readable program code means for causing the computer to perform an optimization of said first intermediate representation annotated with said feedback data updated by said third computer readable program code means, thereby producing a transformed intermediate representation; and

[a] fifth computer readable program code means for causing the computer to re-execute said third and fourth computer readable program code means at least once;

whereby the compiler produces more efficient executable program code from said first intermediate representation, thus speeding up [the] execution of said computer program.

New claims 9-20 are added.